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The Interaction between Defence Spending, Debt service Obligation and Economic Growth in Nigeria

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Abstract.
This paper has sought answers to fundamental questions relating to whether and how military spending determines socioeconomic conditions in developing countries, with special reference to Nigeria. Considering the apparent empirical research results about relationships between defense expenditure and economic development in Nigeria, the following summary can be stated with reasonable confidence with regards to HOD, Defense, Debt, Consumption, Gov.spending, Rgdp and Instability: Firstly, the defense burdens of other developing countries and Nigeria generally correspond to the political, security, and economic realities they face. In other words African states including Nigeria invest in their defense at low levels by global standards. Secondly, Military spending development relationships cannot be characterized in terms of universal empirical regularities governing large heterogeneous groups of countries such as Developing countries like Nigeria. The above findings also reveal a bitter irony or paradox: "States that enjoy relative peace and plenty seem to reap more economic benefits from defense spending, while those suffering from conflict and poverty pay higher economic costs for their defense". Hence in the larger scheme of things, conflict- and poverty-reduction efforts will likely produce more beneficial linkages between defense and development than well-intended calls to reduce military spending in favour of development. It is recommended that governments of developing nations, especially Nigeria, should pay more attention to civil regime in their expenditures; especially expenditure on education rather than military regime, since it is believed that more development could be achieved during the civilian rule than during the military. Government should spend more money on human capital development which is the bedrock of every society, rather than on military spending. When government spends her resources on human capital development, she develops the whole society. So therefore, it is believed that when government does that, the whole of economy of Nigeria, will therefore, be developed
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JEL Classification: D74, F66, H51, H63, O47.

INTRODUCTION

Economic development theories generally agree that the quality of human resources has a significant impact on economic development and growth. This body of thinking is of the opinion that the quality and quantity of labour determine production by virtue of being a factor of production. Moreover, improving the quality of the labour force yields implicit, non economic outputs related to the generation of ideas and decisions which have a significantly positive impact on investment, innovation and other growth opportunities (Roux, 1994).

The analysis of how the defense sector impacts on economic growth and the macro and micro economics of nations has, as might be expected, a long history. Benoit (1973, 1978) reports that defense spending having a positive effect on economic growth for a sample of 44 less developed countries (LDCs) over the period 1950 to 1965. From an economic point of view, and unlike most other forms of government spending, defense expenditure has specific causes and consequences. The causes are manifestly exogenous to the domestic economy and are the result of political, economic, religious, or social interaction at an international level; whereas the consequences are more likely to be felt at the domestic level.

Defense expenditures as a share of total government expenditures had a negative relationship with the level of economic development in Asia and Latin America. In other words, poorer countries spent large shares of total government expenditures on military defense than less poor countries in the study. This inverse relationship is particularly strong for Asia. Structural adjustment programs reduced defense spending in all regions. However, this reduction is not statistically significant.

Many studies have analyzed how government expenditures contribute to economic growth (Barro 1990; Kelly 1997). However, they focused on the impact of total government expenditures and overall GDP growth. Very few studies attempted to link different types of government spending to growth, and even fewer attempted to analyze the impact of government spending at the sector level.

However, the crowding out effect of defense spending on public education and health expenditure is not that simplistic (Roux, 1994). In practice, there are numerous channels by which defense spending or debt service obligations may have an impact on the stock and quality of human capital. Some of these channels may

ultimately be of a positive nature. Against this background, this study attempts to examine the interactions between public expenditure (defense spending and debt service obligations) and public expenditure on human capital development in Nigeria with a view to quantifying the effects for the country.

This study is made up of five (5) Parts. The first part of this study gives a general background to the study and a brief introduction of changing role of government expenditure in the economy. Part two concentrates on the Theoretical Framework as well Review of Related Literature and an Overview of empirical studies. Part three focused on the research methodology, which includes model specification. While four is the presentation of the results and discussion. The final five, is made up of summary, policy recommendations and conclusions.

2.Theoretical Framework and Literature Review

The theoretical framework for the analysis of economic growth is usually evolved from the classic works of Solow (1956). This framework, which is referred to as "neoclassical", generally focuses on the concept of the capacity or potential output of an economy, defined as the output level that is consistent with full employment of capital and labour.

One of the functions of government is stabilization-to encourage a steady rate of economic growth with full employment and stable prices. Stabilization is primarily a macroeconomic function. However, the ways in which government goes about stabilizing also have microeconomic effects on the mix of goods produced (allocation) and the distribution of costs and benefits (redistribution).

Stabilization of the economy is attempted by increasing spending or cutting taxes during periods of depression to increase output and employment, or by cutting spending and increasing taxes during boom periods to control inflation. When spending and taxes are used to stabilize the economy, budget deficits and surpluses become inevitable. For this reasons, stabilization policy is mainly a responsibility of the federal government. Most states and local governments try to stay within a balanced budget on a yearly basis. The federal government, however, has greater borrowing power and can let consideration of price stability and full employment dictates whether or not the budget is balanced.

Economists disagree about how stable the state economy would be if, it were left alone. Even in the 1980s when government taxed and spent a much smaller share of the state income, there were still cycles in economic activity. Periods of deflation (falling prices) and unemployment alternated with periods of inflation and rapid growth. But we cannot say for sure that the state economy would have been more stable with government intervention than without.

Public expenditure is important in the economic development of the country. Through public expenditures, most government objectives are achieved such as long-term growth; economic efficiency and poverty alleviation are achieved. Public expenditure is therefore seen as a means of executing government policies and programmes. In spite of its obvious importance, the study of the actual behaviour of public expenditure appears to have received little attention among economists throughout the first half of the 20th century. However, there are two important and well – known theories of public expenditure. Wagner formulated the first one and the other is Peacock and Wiseman (1961). The determinants of public expenditure vary between developed and developing countries as well as among individual countries over time. It is assumed that as government continues to expand its activities to improve the quality of life of the people, public spending is bound to increase. Hence, public expenditure theories provide analytical economic framework under which changes in government spending are viewed. This study is therefore hinged on the theory of defense spending and government expenditure on human capital development (education and health),debt service obligation and economic growth in Nigeria.

2.2 Defense Spending and Economic Growth

Defense spending, being a component of fiscal policy, has numerous possible theoretical impacts on the economy. These may be positive or negative depending on the specific argument. Defense research and development (R&D) may have positive externalities on the civilian sector through spin-offs and technological transfers. Some arguments relate more to LDCs. Some examples being where defense spending may help with the creation of social infrastructure and other forms of public goods. Defense spending may increase the skill set of the population through training and education of military personnel. Defense spending provides security which promotes a stable business environment by encouraging foreign investment. On the negative side, it is possible that defense spending crowds out private spending, where resources can be put to more productive use. Arms imports can have adverse balance of payments effects. Defense spending may also divert resources from the export sector of an economy where similar levels of technology may be put to use. Given the conflicting theoretical effects of defense spending, much research has centered on the actual empirical findings (Nigel Wilkins 2004).

There are various schools of thoughts on the nature of the relationship between the defense sector and

economic growth. Military Keynesians contend that defense expenditure is a tool of fiscal policy and can therefore be increased to stimulate demand or decreased to dampen demand. Intrinsic to this view is that defense expenditure has positive effects on the Macro economy: This impact depends on the extent of the multiplier effect, assuming there is not a corresponding increase in taxation to pay for the spending and the extent, if any, of crowding out caused by the spending. The Marxist view is more extreme and contends that defense spending is necessary because of under consumption in advanced western capitalist economies. The opposing school of thought to that of the Military Keynesians is that defense expenditure has negative effects and if used as a tool of fiscal policy would only make the situation worse. This is usually based on a type of supply side argument where resources used in defense are more efficiently used elsewhere. This argument is considered stronger when used with respect to LDCs and Nigeria respectively.

Given the relative example nature of the question, most studies trying to find an answer can be classified into those that find positive benefits and therefore support the military Keynesian point of view, those that find negative benefits refuting the Keynesians and those that conclude there are insignificant linkages between defense and economic growth. The following is a short summary of some of the empirical literature that has emerged since the beginning of the last decade (see Sandler and Hartley, 1995a, 1995b). Atesoglu and Mueller (1990) use a two sector Feder-Ram model for the US over the period 1949 to 1989. They find a positive effect from the defense sector to the civilian sector. Stewart (1991) applies a Keynesian demand function to a group of LDCs. He finds that both defense and non-defense expenditure has positive effects on growth, but that the effect of non-defense spending is stronger. Ward, Davis, Penubarti, Rajmaira and cochran (1991) use a three sector Feder-Ram model with separate externality and productivity effects for India over the period 1950 to 1987. Defense expenditure is found to have a positive effect on growth. Mueller and Atesoglu (1993) incorporate technological change into a two sector Feder-Ram model using US data for the period 1948 to 1990. They find a significant relationship from defense to growth. Scheetz (1991 and 2002) uses pooled cross section time series data for four Latin American countries (Chile, Argentina, Peru and Paraguay) over the period 1969 to 1987. He finds defense expenditure has a negative effect on investment. Ward and Davis (1992) use a three sector Feder-Ram model for the USA over the period 1948 to 1990. They separate the effects of defense spending into productivity and externality effects. Overall, they find defense spending has a negative effect on economic growth, with a negative productivity effect but a positive externality effect.

Galvin (2003) used 2SLS and 3SLS to estimate a demand and supply side model for 64LDCs using cross sectional data. He concludes that defense spending has negative effects for both economic growth and the savings income ratio. Mintz and Huang (1990) using a three equation model for the US find defense expenditure negatively impacts on investment and therefore growth. Chowdhury (1991) undertakes Granger causality testing using defense burden time series for 55 LDCs. He finds positive causality from defense to growth for seven countries, negative causality for 15 countries, no causality for 30 countries and bi-directional causality for three countries. Huang and Mintz (1990) estimate a three sector Feder-Ram model using ridge regression techniques to overcome multicollinearity problems using annual data for the USA over the period 1952 to 1988. They do not find any relationship between defense and growth.

Huang and Mintz (1991) extend their earlier model by separating the defense effect into productivity and externality effects.Adams, Behrman and Boldin (1991) use a three sector model (defense, non-defense and export) with cross sectional and time series data for a group of LDCs over the periods 1974 to 1986. Their finding was that defense spending has no effect on growth, whereas exports have a positive effect. Gerace (2002) uses a spectral analysis type methodology to investigate movements in US military expenditure, US non-military expenditure and US GDP. He finds evidence that non-military expenditure is used as a counter-cyclical stabilization tool, but that military expenditure is not.

The availability of external loans increases the propensity of governments to spend on the military (Hewett, 1991). It is not uncommon for military spending and payments on foreign debt to absorb 40 – 80 percent of current government revenue. For example, in 1987 these two items accounted for 55 percent of government revenue in SriLanka, 61 percent in Pakistan, 64 percent in the Philippines, 65 percent in Colombia and 85 percent in Jordan (Deger and Sen, 1990[b]). Indeed, as Olaniyi (2002) notes "the existence of multiple paradigms illustrates the lack of theoretical consensus on the impact of military spending on the economic and social sectors".

A number of scholars, international organizations and civil society group argue that, if public resources are fixed, military spending occurs at the expense of state-driven initiatives to improve public welfare. Moreover, the peace dividend literature suggests 'that decreases in military spending will release resources for other, more productive purposes. The opportunity costs of military spending will be influenced by a country's defense spending decision-making process. A government's allocation of resources also depends on regime type; highly militarized governments are more prone to prioritizing, military spending over development spending. (Edame, 2009).

Some scholars argue that military spending inhibits democratic and human resource development. Other research indicates that the military provides the security and stability, and the foundations of modernization that are the preconditions of social development. There is also a lack of consensus in the literature on the impact of military spending on economic growth. Some arguments indicate that military spending helps bring an economy to full employment, to mobilize unused resources and to increase demand for output. Research underscoring the negative impact of military spending on economic growth notes that military spending may contribute to a country's debt burden, and that investment in the military may occur at the expense of investment in the civilian industrial sector.

2.3The Opportunity Costs of Military Spending and Debt burdens

There are two major arguments for the opportunity costs of military spending. These include main arguments and counter arguments on military spending in a developing economy, such as Nigeria.

Opportunity costs arguments are based on the premise that, if public resources are fixed, military spending occurs at the expenditure of state-driven initiative to improve welfare through government spending on health, nutrition, sanitation and education. Hewitt (1991) noted that a country with fixed resources that wishes to increase its spending on the military has a number of options, all of which have negative economic consequences. First, the government can increase its overall budgetary expenditures, consequently raising taxes and reducing private investment and consumption. Secondly, it can cut spending in public infrastructure programs and economic services. A third option available to governments is to borrow foreign exchange in order to increase military spending (Willett, 1999).

The HDRs index on resource use that compares the percentage of GDP a country spends on health and education and it includes that of military spending.

Also, Ruth Leger Sivard's World Military and Social Expenditure series offers an index of "Comparative Resources" which compares the amount of money (in total and as a percentage of GNP) countries spend on public services like the military, education and health. In addition, it compares the number of citizens employed by the armed forces to the number of teachers and physicians. This annual publication implies that money spent on the military has a negative impact on social well-being, especially in developing countries. In 1999, the World Bank stated:

> Since the early 1990s, the World Bank has been involved in security-related work through a variety of lending and non-lending instruments and mechanisms. That realization that many of the Bank's borrowers maintained levels of military spending that crowded out social spending.

Indeed, the Bank recognized the opportunity costs of military spending and concluded that military expenditure may divert resources from the development agenda of some borrowers. (See World Bank, 1999). Deger and Sen (1990a) research the impact of military spending on a single human development indicator. In another study, Adeola (1996) uses a bivariate correlation analysis to test the impact of militarization on health and the quality of life. In this study, total military expenditures, military expenditures as a percentage of GNP, per capita military expenditures, military participation ratio, and arms imports serve as indicators of militarization. Adeola (1996) concludes that "the influence of military variables examined is clearly detrimental to human health and the quality of life".

2.4 Education Expenditure and Human Capital Development

Human capital formation or development is becoming very significant because of new challenges in the total environment. According to Adamu (2003) in Awofegba, (2002) human capital formation transcends mere acquisition of intellectual ability through formal education system. It has to do with the transformation of the total man to enhance his productivity. Therefore, human capital investment is an indispensable component of the development process. it is a force that can help in tackling inequalities and poverty in any nation. Furthermore, that investment in people makes it possible to take advantage of technical progress as well as to continue that progress. Besides, differences in education endowment lead to differences in per capita income of the individual, that is, persons with higher education on the average earn higher incomes (Adamu, 1983).

Buffie (1994) in a cross-country study investigated the repercussions of reducing human capital expenditure in his model, he distinguished between skilled and unskilled labour in manufacturing sector. Economist like Adam Smith (1937) had already stressed the significance of education in human capital formation. Therefore, it follows that from the above evidence that a reduction in the investment on education would necessarily affect the stock of the overall human capital base, and of the physical capital and productivity. Investment in human capital development are considered critical element of effort to alleviate poverty, and it follows that inadequacies in human resources often are a manifestation of poverty.

Umo (1985) in Odedokun (2001) noted that in Nigeria educational investment has grown at a phenomenal rate at the time that the economy is experiencing dynamic structural shifts due mainly to the emergence of oil sector as the main propeller of growth. However, Umo added that at present, severe financial

and economic constraints have affected all levels of education and their capacity to provide services and also the capacity of students and their families to finance formal education studies. The implication of Umo's work is that Nigeria was not spared and the nation was caught in the Webb of Structural Adjustment Programme (1986 – 89). This situation started manifesting itself in both the primary and tertiary levels of education in Nigeria since the structural adjustment of the 1986. A major finding of the World Bank (1994) was that compared with many other countries (Ghana, Cameroon, Kenya, Zimbabwe, Philippines, Thailand and Mexico). Nigeria up to date spent less of its total government budget in education, and education expenditure, as a percentage of GNP was higher in Ghana, Kenya and Zimbabwe than in Nigeria. It can be pointed out here that if the present trend of funding education in Nigeria continues, there is the fear that the position of the education financing would deteriorate further and the aftermath on the overall human capital development in the country would be grave.

In the case of Tertiary system in which specialized human capital development is affected, the funding problem took root from the Federal Government assumption of proprietorship of Nigeria University in 1975. In the report of the review of higher education in Nigeria (1987) it was stated that prior to the time, higher institutions could be said to have been adequately funded or at least to be in a position to "cut their coat according to their available cloth". And that until a decade ago, financing of university education in Nigeria seemed the most secure activities with little or no serious financing problem confronting either the policy makers at the federal and state levels. It can be confirmed here that both the Federal Government and individuals who study the education sector in Nigeria are quite aware of the deterioration of funding of education in general and higher education in particular. Also, that governments of modern nations spend large sums of money on programmes of human resources development, and public expenditures for education alone range from about 2 percent to over 7 percent of national income.

The federal and state governments have found it increasingly difficult to meet recurrent and capital costs required to support the rapid expansion in education (Okojie, 1995, Okojie, 2003, Nwankwo & Edame, 2010). In addition, it is apparent that government had been spending a smaller proportion on capital expenditure than recurrent expenditure hence our educational institutions have been in a deplorable state of neglect. The quest for proper funding of education in Nigeria to 26% UNESCO recommendation has been the root cause of the unending crises between governments and teachers unions (ASUU) which have continued to afflict the three tiers of educational system especially the universities to date. It is glaring that the financing of educational programmes and activities therefore is a significant issue that merits consideration in both budgetary and overall developmental planning of any nation especially Nigeria as a developing country among others.

Empirical evidence on the government spending-growth relationship is diverse, mostly based on cross-section studies that often include a sample of both advanced and developing countries. The main conclusion in most of these studies is that government consumption spending has a negative impact on growth (Barro, 1991, Easterly and Rebelo, 1993; Tanninen, 1999). Studies using a sample of only advanced (mostly OECD) countries obtain similar results. For instance, Hansson and Henrekson (1994) find that government consumption spending is growth-retarding but spending on education impacts positively on growth. Kneller et al (1998) find that productive spending has a positive, while non-productive spending has a negative impact on growth of OECD countries (1970-95). Ram (1986), using a sample of 115 countries, found government expenditure to have significant positive externality effects on growth particularly in the developing countries (LDC) sample, but total government spending had a negative effect on growth.

3.Research Methodology and the Econometric Model

The study uses cointegration and its implied error correction model. Cointegration and error correction modelling has gained prominence in time series econometrics since its development in the London School of Economics and Oxford in the late 1980s because it by-passes the worst excesses of spurious regressions caused by non-stationary time series data (such as data on income, consumption, money demand, the price level, trade flows, exchange rate, etc.) and at the same time provides information on long-run relationships as well as short term dynamics in the same model (see for instance, Granger, 1986; Engle and Granger, 1987; Adam, 1992, Edame, 2009, Nwankwo and Edame,2010).

3.2 Model Specification

In this study, we specify a model relating human capital development to defense spending, debt service expenditure, real gross domestic product growth and political instability. It is hypothesized that within the model, human capital development and defense expenditure are jointly determined, while the remainder of the variables are exogenous to the system, or at least exhibit weak exogeneity.

Given that human capital development and defense expenditure are assumed endogenous to the system, the vector auto-regression (VAR) representation of our model, following Sims' (1980) can be specified as:

$$Z_t = \delta + A_1 Z_{t-1} + A_2 Z_{t-2} + ... + A_{P-1} Z_{t-P+1} + \psi X_t + U_t \quad \text{..... (1)}$$

Where:
Z_t is a (n x 1) vector of non-stationary I(1) endogenous variables;
X_t is (q x 1) vector of exogenous variables;
δ is a (n x 1) vector of parameters;
A_i are (n x n) matrix of parameters;
Ψ is a (n x q) matrix of parameters; and
U_t is an (n x 1) vector of random variables with the usual stochastic assumptions.
From the above specification,
$Z_t = [HCD_t, DFS_t]'$; and
$X_t = [DSV_t, GDP_t, PLS]'$
Where:
HCD_t is expenditure on human capital development;
DFS_t is expenditure on defense;
DSV_t is expenditure on debt servicing
GDP_t is real GDP growth; and
PLS is dummy variable for political instability.

The VAR in equation (1) can be re-written in its vector error correction form thus:

$$\Delta Z_t = \delta + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + ... + \Gamma_{P-1} \Delta Z_{t-P+1} + \Pi Z_{t-P} + \psi X_t + U_t \quad \text{..... (2)}$$

Where:

Z_t is a vector of non-stationary I (1) endogenous variables; $\Delta Z_t = Z_t - Z_{t-1}$;
X_t is a vector of stationary I (0) exogenous variables;

Π and Γ_i are (n x n) matrices of parameters with $\Gamma_i = -(I - A_1 - A_2 - ...A_i)$; $(i = 1,...k-1)$ and $\Pi = I - \Pi_1 - \Pi_2 ... \Pi_k$.

From the above specification, the information about the short-run and long-run adjustments to the changes in Z_t through the estimates of Γ_i and Π respectively can be obtained. The term ΠZ_{t-k} provides information about the long-run equilibrium relationship between the variables in Z_t.

On a priori grounds, the coefficient of the expenditure on defense (DFS_t)is expected to carry a negative sign, since increasing defense spending would reduce spending on human capital development, ceteris paribus. In the same manner, a negative coefficient for debt service expenditure (DSV_t) is conjectured since there is an inverse relationship between debt service expenditure and expenditure on human capital development. The coefficient of real GDP growth (GDP_t) is expected to take on a positive sign given that expansion in economic activity is supposed to influence human capital development positively. Lastly, the coefficient of the dummy variable for political instability may take on a positive or negative sign.

The study adopts the Johansen Maximum Likelihood procedure of cointegration. In this method, a preliminary analysis is carried out first to assess the order of integration of the data series through the use of unit root tests after which we test for the existence of cointegrating (long-run equilibrium) relationships among the data series. If a valid cointegrating relationship is found, then we estimate a vector error correction model, cointegration being a pre-condition for the estimation of an error correction model (see Edame, 2009).

3.3. Test for Unit Roots

Consider the simple first order autoregressive, $AR(1)$ model shown in equation (3) below. A stationary series is one where $|\rho| < 1$. The series have a finite variance, transitory innovations from the mean, and tendency for the series to return to their mean value. This means that a stationary series Y_t for example has a mean, variance and autocorrelation that is constant over time, implying that the error structure is time invariant (Adam, 1992).

In contrast, a non-stationary series is one where $|\rho| \geq 1$. They have a variance which is asymptotic infinite; the series rarely crosses the mean and innovations to the series are permanent. That is any stochastic shock may not return to a proper mean level. A classic example of a non-stationary series is a random walk where $|\rho| = 1$. Thus, Y_t is said to be integrated of order *I(1)*. Since α is unity, *Y* is said to have a "unit root".

$$Y_t = \alpha + \rho Y_{t-1} + \mu_t \quad \text{.....(3)}$$

A non-stationary time series has important asymptotic consequences: regression estimates do not converge in probability with increased sample size, R-square values have non-degenerate distributions, and

divergence in t-value distributions often exist such that asymptotically correct critical values do not exist. Regressions involving non-stationary variables in levels often display first-order serial correlation and lead to spurious results.

To carry out the unit root test for stationarity, the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests are used to examine each of the variables for the presence of a unit root (an indication of non-stationarity). The DF test assumes that the data generating process is a $AR(1)$ process, and so if this is not so the autocorrelation in the error term will bias the test. The ADF is used to avoid such bias in the test since it includes the first difference in lags in such a way that the error term is distributed as white noise. The test formula for the DF and ADF are shown in equations (4) and (5) respectively.

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \mu_t \quad \text{..... (4)}$$

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \sum_{t-1}^{j} \gamma \Delta Y_{t-j} + \mu_t \quad \text{.....(5)}$$

Where: the lag length *j* chosen for ADF ensures that μ_t is empirical white noise.

Here the significance of ρ is tested against the null that ρ = 0, based on t-statistics on ρ obtained from the OLS estimates of equations (4) and (5). Thus if the null hypothesis of non-stationarity cannot be rejected, the variables are differenced until they become stationary, that is until the existence of a unit root is rejected. We then proceed to test for co-integration.

3.3.1 Test for Cointegration

The purpose of the cointegration test is to determine whether groups of non-stationary series are cointegrated or not. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. Thus, if such a stationary linear combination exists, the non-stationary time series are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship among variables.

To test for cointegration, we consider the vector error correction model specification in equation (2). Information about the number of cointegrating relationships among the variables in Z_t is given by the rank of the Π-matrix: if Π is of reduced rank, the model is subject to a unit root; and if 0<r<n, where r is the rank of Π, Π can be decomposed into two (n x r) matrices α and β, such that $\Pi = \alpha\beta'$, where $\beta' Z_t$ is stationary. Here, α is the error correction term and measures the speed of adjustment in ΔZ_t and β contains r distinct cointegrating vectors, that is cointegrating relationships between non-stationary variables. The Johansen method uses the reduced rank regression procedure to estimate α and β and the trace test statistic is used to test the null hypothesis of at most r cointegrating vectors against the alternative that it is greater than r. The interest here is in testing for the presence of a valid cointegrating vector which gives a unique long-run equilibrium relationship. Once this is established, the vector error correction model of the form given below can be estimated.

$$\Delta HCD_t = \delta_0 + \sum_{i=1}^{2} \delta_{1i} \Delta HCD_{t-i} + \sum_{i=1}^{2} \delta_{2i} \Delta DFS_{t-1} + \sum_{i=1}^{2} \delta_{3i} \Delta DSV_{t-i} + \sum_{i=1}^{2} \delta_{4i} \Delta GDP_{t-i} + \delta_5 PLS - \alpha(HCD_{t-1} - DFS_{t-1}) + U_t \quad \text{..... (6)}$$

Where all the variables are as earlier defined and Δ is the first difference operator while δ_1 to δ_5 are short-run coefficients and α is the error correction mechanism which measures the speed of adjustment from short-run disequilibria to long-run steady-state equilibrium. U_t is the error term assumed to be distributed as white noise.

Given the above vector error correction model in (6), the long-run cointegrating equation for human capital development can be written as:

$$HCD_t = \phi_0 + \phi_1 DFS_t + \varepsilon_t \quad \text{..... (7)}$$

Where: ϕ_0 is a constant and ϕ_1 is the long-run static coefficient and ε_t is the random term.

The estimations will be performed using the Standard Version of Eviews Econometric Software.

3.4 The Data

The data for the proposed study are annual, spanning a period of thirty-four years (1970 to 2003), and was sourced from the Central Bank of Nigeria (CBN).

4. Presentation of Empirical and Regression Results.

To analyze the interaction between military spending, debt service obligations, human capital development, in developing countries using Nigeria as a case study the period under review, the regression analysis model was used. Defense, debtconsumption, government spending, Real Gross Domestic Product (RGDP) and instability were regressed against HOD in the Nigerian economy (From 1970 – 2003).

	Mean	**Std Deviation**	**N**
HOD	2385.8959	4511.84273	29
Defence	2194.5331	4013.36857	29
Debt	2636.0979	4704.57365	29
Consumption	6795.8972	11572.09683	29
Gov. spending	21213.903	37739.64046	29
Rgdp	8401.6991	12453.13790	29
Instability	0.5517	0.50612	29

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-49.622	42.908		-1.156	.260
	Defence	.939	.023	.835	40.884	.000
	Debt	.345	.026	.360	13.215	.000
	consumption	-.012	.012	-.032	-1.048	.306
	gov.spending	-.027	.003	-.230	-8.301	.000
	Rgdp	.018	.006	.050	2.992	.007
	instability	-40.321	53.596	-.005	-.752	.460

a. Dependent Variable: HOD

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-22.9162	17219.188	2385.8959	4510.54342	29
Residual	-212.3127	279.18134	.00000	108.27230	29
Std. Predicted Value	-.534	3.289	.000	1.000	29
Std. Residual	-1.738	2.286	.000	.886	29

a. Dependent Variable: HOD

4.2 Analysis of the Result.

Tables 4.5 & 4. 6 showing Coefficients and Residual statatistics

The estimated regression result has a negative intercept which is represented by the constant term -49.622. This further shows a high positive relationship between HOD and Defense, HOD and Debt, HOD and

consumption, HOD and government and HOD and RGDP. This implies that an increase in HOD will lead to an Increase in Defense, Debt, consumption, government spending and RGDP. Contrary to this HOD is inversely proportional to instability in that there is a very small (negligible) relationship between HOD and instability. Therefore an increase will not amount to a significant increase in instability.

4.3 Tests for the Explanatory Ability of the Parameter.

The adjusted R-square value of 0.999 shows about 99.9 percent of the total variation in the dependent variable has been explained by the independent variables and only about 0.1percent was not accounted for. This model has a good fit.

5. Summary, Recommendation and Conclusion

This paper has sought answers to fundamental questions relating to whether and how military spending determines socioeconomic conditions in developing countries, with special reference to Nigeria. Considering the apparent empirical research results about relationships between defense expenditure and economic development in Nigeria, the following summary can be stated with reasonable confidence with regards to HOD, Defense, Debt, Consumption, Gov.spending, Rgdp and Instability:

Firstly, the defense burdens of other developing countries and Nigeria generally correspond to the political, security, and economic realities they face. In other words African states including Nigeria invest in their defense at low levels by global standards.

Secondly, Military spending development relationships cannot be characterized in terms of universal empirical regularities governing large heterogeneous groups of countries such as Developing countries (Nigeria). Rather, such relationships are elusive, complex, and variable. Nevertheless, these variations can be explained substantially by controlling key economic, political, and security factors. Among the differentiating national attributes or conditions that have been shown to affect socioeconomic development systematically are regime legitimacy, stability, and effectiveness, the presence or absence of conflict, arms production capacity, and availability of economic resources. Further research will likely show that other theoretically relevant variables will also prove to be partial determinants of milex-growth patterns among Third World and African states ("Milex" is a European Defence Agency acronym meaning "Military exercise").

5.2 Policy Recommendations

1. Analysts and policymakers need to see milex-development issues as more complicated and convoluted than they have before. Research and policy designs need to identify and take into account key factors that determine the nature, level, and distribution of positive and negative effects of national defence burdens.
2. The above findings also reveal a bitter irony or paradox: "States that enjoy relative peace and plenty seem to reap more economic benefits from defence spending, while those suffering from conflict and poverty pay higher economic costs for their defence". The implications of this dualism are not comforting, analytically or policy wise: states did not afflict by legitimacy crises or armed conflicts, especially civil wars and other security crises that threaten incumbent regimes, are unlikely heed pleas to reduce military spending, nor will such appeals resonate strongly in relatively placid and prosperous states.
3. Hence in the larger scheme of things, conflict- and poverty-reduction efforts will likely produce more beneficial linkages between defence and development than well-intended calls to reduce military spending in favour of development.
4. It is recommended that governments of developing nations, especially Nigeria, should pay more attention to civil regime in their expenditures rather than military regime, since it is believed that more development could be achieved during the civilian rule than during the military. Government should spend more money on human capital development which is the bedrock of every society, rather than on military spending. When government spends her resources on human capital development, she develops the whole society. So therefore, it is believed that when government does that, the whole of economy of Nigeria, will therefore, be developed.

5.3 Conclusion

Defence spending produces a variety of both positive and negative effects. The precise mix of such effects varies across countries. The overall effects, whether positive or negative, are usually not pronounced. The modal socioeconomic impact of defense spending is slightly negative. In Nigeria, such negative effects seem to be somewhat wider and deeper. Negative relationships between milex and development tend to be most evident and severe in countries experiencing legitimacy/security crises and economic/budgetary constraints. These findings convey both good and bad news. The good news is that Developing countries (Nigeria's) military spending patterns reflect rational adaptations to 'conditions on the ground', are explicable in terms of specific sets of political, economic, and security variables, and typically do not impose undue socioeconomic costs, especially if the public security/defence benefits are included in the balance sheet. The bad news is that generations of analysts and policymakers too often have been barking up the wrong tree on the dual assumptions that military

spending is wasteful – if not detrimental – to development and that its reduction or reallocation to social and economic programmes will be beneficial. Furthermore, their Undue quest to discover global milex–development relationships has produced more Chaos than cure. The absence of clear, uniform relationships between military spending and development means that 'one size fits all' assumptions, theories, models, measurements, judgments, and policy recommendations on guns versus butter issues are bound to be problematic at best and likely to fail.

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Table 4.1: Descriptive Statistics of Military Spending from Year 1970-2003.

	HOD	Defense	Debt	Consumption	Gov.spending	Rgdp	Instability
Pearson Correlation	1.000	0.996	0.966	0.878	0.870	0.901	-0.413
HOD	0.996	1.000	0.963	0.895	0.891	0.903	-0.407
	0.966	0.963	1.000	0.939	0.944	0.901	-0.416
Defense	0.878	0.895	0.939	1.000	0.976	0.928	-0.318
Debt	0.870	0.891	0.944	0.976	1.000	0.885	-0.365
	0.901	0.903	0.910	0.928	0.885	1.000	-0.256
Consumption of Gov. spending	-0.413	-0.407	-0.416	-0.318	-0.365	-0.256	1.000
Rgdp							
Instability							
Sig. (1-tailed)		0.000	0.000	0.000	0.000	0.000	0.013
HOD	0.000		0.000	0.000	0.000	0.000	0.014
	0.000	0.000		0.000	0.000	0.000	0.012
Defense	0.000	0.000	0.000		0.000	0.000	0.046
Debt	0.000	0.000	0.000	0.000		0.000	0.026
	0.000	0.000	0.000	0.000	0.000		0.090
Consumption	0.013	0.014	0.012	0.046	0.026	0.090	
Gov. spending							
Rgdp							
Instability							
N	29	29	29	29	29	29	29
HOD							
Defence	29	29	29	29	29	29	29
Debt	29	29	29	29	29	29	29
Consumption	29	29	29	29	29	29	29
Gov. spending	29	29	29	29	29	29	29
Rgdp	29	29	29	29	29	29	29
Instability	29	29	29	29	29	29	29

Table4. 2: Showing Correlations between HOD, Defense, Debt, consumption, Gov. Spending, Rgdp, and Instability. Model	**R**	**R square**	**Adjusted R square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	0.1100[a]	0.999	0.999	122.14763	2.324

Table4. 3: Showing model summary[b]

a. Predictors; (Constant), instability, Rgdp, gov. spending, Defence, Debt, consumption.
b. Dependant variable: HOD.

Model	Sum of Squares	Df	Mean square	F	Sig.
1	Regression	6E + 008	6	94943342.222	0.000[a]
	Residual	328240.94	22	14920.043	
	Total	6E +008	28		

Table 4.4: Showing ANOVA table of Data being analyzed.

a) Predictors: (Constant), instability, Rgdp, gov. spending, Defence, Debt, consumption.
b) Dependant variable: HOD.